a conductive track extending over the silicon substrate between the second region and the wall;

a third region of the first conductivity type having a high doping level formed in the substrate under a portion of the conductive track approximately halfway between the second region and an internal periphery of the wall; and

a field plate which is insulated from the track and extends widthwise at least substantially across the track and lengthwise on either side of the third region in the direction of the wall and of the second region, at least a portion of the field plate being in contact with the third region.

REMARKS

In response to the Office Action mailed August 14, 2002, Applicant respectfully requests reconsideration. Claims 1-4 are now pending in this application, of which, claims 1 and 4 are independent claims. The application as presented is believed to be in allowable condition.

A. Rejections under 35. U.S.C. § 103

The Office Action rejects claims 1-3 under 35 U.S.C. § 103(a) as being unpatentable over Applicant's admitted prior art (APA) in view of Whitney (WO 95/04374). Applicant respectfully traverses this rejection.

Referring to Figs. 1, 2B and 3, APA discloses various configurations of a high voltage power component delimited at its periphery by an insulating wall 2, that attempt to a) prevent leakage currents in the device (Fig. 1 and 2B) and b) increase the cathode breakdown voltage (Fig. 3). To avoid leakage currents, it is known to use a "stop-channel" region formed of a heavily-doped N+ area 10 between the external periphery of region 6 and the internal periphery of wall 2, the area 10 forming a ring that extends over the entire periphery of the component (see Fig. 2B). However, as shown in Fig. 2B, the presence of stop-channel region 10 tends to cause a deformation of the equipotential surfaces which lowers the breakdown voltage of the device (see APA pages 2 and 3). APA also discloses several conventional configurations of a device that allow for a high breakdown voltage and which are usually alternately used (see Fig. 3 and APA pages 3 and 4). According to one solution, floating field plates are provided above the device and below track L and arranged such that they are capacitively coupled with the silicon.

However this solution has the disadvantage of being strongly dependent on the quality of the oxides and may require manufacturing equipment that is not readily available in power component manufacturing technologies. Another solution places a field plate 15 in contact with insulating wall 2 and extending inwards from the wall. However, this structure implies an extension of the field plate beyond the component well which adversely affects the breakdown voltage of the well, and in some cases may not work at all (see APA page 4). APA does not disclose that any of the solutions illustrated in Fig. 3 may be used with a device having the N+ region of Fig. 2B. Figs. 2B and 3 illustrate different solutions for solving different problems.

Whitney discloses an integrated circuit wherein a reverse field plate is connected to the semiconductor substrate rather than to a diffused layer. According to Whitney, to avoid junction breakdown in components, the transition region near the surface of the substrate is graded to widen the transition region, the grading being implemented by diffusing a relatively lightly doped material at the junction (see Fig. 1). To render the graded junction terminations less susceptible to surface charges, field plates are mounted over the passivating layer and adjacent the terminating structure. Referring to Fig. 2, Whitney discloses that the field plate 31 (including portion 34) is on contact with N+ region 35and extends leftwards across termination 27. Whitney does not disclose or suggest that the field plate 31 extends toward the right on the other side of N+ region 35.

Applicant does not agree that the combination of APA and Whitney suggested in the Office Action is proper. However, even if one were to make the suggested combination, Applicant's claims patentably distinguish over the combination. In particular, Applicant's independent claim 1 recites, *inter alia*, "a third region of the first conductivity type of high doping level formed in the substrate under a portion of the track substantially halfway between the second region and the internal periphery of the wall, the third region being contacted by a field plate which is insulated from the track, and extends widthwise at least substantially across the track and lengthwise on either side of the third region in the direction of the wall and of the second region." As acknowledged in the Office Action, APA does not disclose or suggest "a third region of the first conductivity type of high doping level...contacted by a field plate," as is recited in Applicant's claim 1. While Whitney does disclose a field plate 31 (actually portion 34) in contact with an N+ region 35 (see Fig. 2), Whitney does not disclose or suggest that the

field plate "extends widthwise at least substantially across the track and lengthwise on either side of the third region in the direction of the wall and of the second region." As discussed above, Whitney discloses only that the field plate 31 extends from one side of the N+ region toward and across the termination 27 (see Whitney's Fig. 2). Therefore, for at least this reason, Applicant's claim 1 patentably distinguishes over the suggested combination of APA and Whitney.

Dependent claims 2 and 3 depend from claim 1 and are therefore allowable for at least the same reasons as claim 1.

Accordingly, withdrawal of the rejection of claims 1-3 is respectfully requested.

B. Newly Added Claim

New independent claim 4 has been added to further define Applicant's contribution to the art. New claim 4 recites, *inter alia*, "a field plate which is insulated from the track and extends widthwise at least substantially across the track and lengthwise on either side of the third region in the direction of the wall and of the second region, at least a portion of the field plate being in contact with the third region." As discussed above in reference to claim 1, the prior art of record does not disclose or suggest a field plate extending on either side of the third region. Therefore, for at least this reason, new claim 4 is patentable over the art of record and is in condition for allowance.

CONCLUSION

In view of the foregoing amendments and remarks, this application should now be in condition for allowance. A notice to this effect is respectfully requested. If the Examiner believes, after this amendment, that the application is not in condition for allowance, the Examiner is requested to call the Applicants' attorney at the telephone number listed below.

If this response is not considered timely filed, and if a request for an extension of time is otherwise absent, Applicants hereby request any necessary extension of time. If there is a fee

occasioned by this response, including an extension fee, that is not covered by an enclosed check, please charge any deficiency to Deposit Account No. 23/2825.

Respectfully submitted,
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